

Analysis of Interlibrary Loan at the National Institute of Standards and Technology Library: lessons learned

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Abstract

Purpose – The paper seeks to study whether process and cost-effective improvements could be made to the Interlibrary Loan and Internal Document Request services at NIST.

Design/methodology/approach – The authors analyze the usage data from the automated management system over a two-year period.

Findings – Heavy users, types of materials and journal titles were identified as well as process improvements. Anticipating rising costs remains elusive.

Originality/value – The paper gives valuable insights into the workings of document supply in a major research institution in the USA, particularly in relation to costs.

Keywords Collections management, Document delivery, Interlending

Paper type Case study

Institutional background

The National Institute of Standards and Technology (NIST) is a non-regulatory federal agency within the US Department of Commerce. Its mission is to promote US innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life. NIST is located in Gaithersburg, Maryland and Boulder, Colorado, employing about 3,000 scientists, engineers, technicians, and support and administrative personnel. About 1,800 NIST associates complement the staff. In addition, NIST partners with 1,400 manufacturing specialists and staff at affiliated centers around the country. Research conducted at NIST is frequently industry/subject specific; one high-profile study recently completed by the agency is the Final Report on the Collapse of the World Trade Center Towers (available at: <http://wtc.nist.gov>).

The NIST Research Library, formally named the Research Library and Information Group (RLIG), is one of two groups within the NIST Information Services Division (ISD); the other unit is the Electronic Information and Publications Group (EIPG). ISD also administers the Museum and History Program, which maintains an Archive and a Museum. The Research Library has a staff of 16 and maintains a collection of approximately 300,000 volumes and 1,300 journal subscriptions, including 1,200 with electronic access. Its primary customers are the Gaithersburg researchers working in eight Laboratories and three Program Offices, including Building and Fire Research (BFRL), Chemical Science and Technology (CSTL), Electronics and Electrical

Engineering (EEEL), Information Technology (ITL), Manufacturing Engineering (MEL), Material Science and Engineering (MSEL), Physics (PL), and Technology Services (TS).

Introduction

In the fall of 2001, ISD gained valuable feedback about its customers' needs through a Customer Satisfaction Survey (Silcox and Deutsch, 2003), revealing unmet needs, service and communication issues, and organizational strengths. While the customer survey did not specifically seek feedback on the Research Library's Interlibrary Loan service, survey responses indicated that this is a highly valued and relied upon service. Despite this high value, the survey results indicated that a number of improvements to the service were warranted. Concerns included the lack of a mechanism for checking on the status of requests and the length of time taken to fill requests.

A benchmark study executed in the same year (Deutsch and Silcox, 2003) indicated that the NIST Research Library had filled more requests than all of its benchmark partners and filled an above average number of requests per customer. However, the Research Library had also spent more money, both overall and per customer, than its benchmark partners. Based on these two studies, the Research Library decided to review its Interlibrary Loan services for efficiencies and cost saving process improvements.

During the summer of 2002, usage data on the costs were analyzed. As a result, new processes and systems, including an automated management system, OCLC ILLiad was implemented in the fall of 2002. ILLiad enables customers to input and track their requests electronically from their desktops. It also automates the processing of requests, enabling the Research Library staff to better track expenses and activity.

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Methodology

Usage data from a two-year period, October 2002 through September 2004 were extracted from the ILLiad database, tabulated, and analyzed. The analysis was published as an internal NIST report in August 2005. This article summarizes key aspects of that study.

The Research Library uses Microsoft Access to retrieve data from the ILLiad system's backend database (served by Microsoft SQL Server). This configuration allows for the creation of custom queries to extract data from the various database tables and fields within ILLiad. The data can then be displayed in customized reports and spreadsheets. In addition, the reports can be saved and made available to the Research Library staff to run at any time. Types of materials, costs, heavy usage customers, and popularly requested titles were identified from these custom reports. Analysis of the data also revealed processes that can be improved.

Overview and definitions of interlibrary loan terminology

The NIST Research Library's Interlibrary Loan service borrows materials that are not part of its collection in support of research efforts by its customers. This is referred to as "document supply". The primary vehicle for identifying sources and obtaining materials is OCLC.

Internal document requests are fulfilled for items held in the NIST Research Library's collection. Items are reproduced or delivered either electronically or in hardcopy format according to customer preference. Customers requesting items from electronic journal subscriptions are directed to the appropriate site in the Research Library's electronic journals page within the NIST Virtual Library (NVL).

During 2001 and 2002, NIST unveiled a ten-year strategic plan that identified several research focus areas, including Healthcare and Nanotechnology. As a result, the Research Library saw an increase in the number of requests for biomedical and health-related articles. The Research Library entered into an agreement with the National Institutes of Health (NIH) to purchase articles indexed in the PubMed database. Customers locate citations and order the full text via Loansome Doc, PubMed's document ordering service. Requests are routed to the Research Library's ILLiad system for verification and tracking. Articles are supplied directly to the customer via email from NIH or the National Library of Medicine (NLM).

Findings from the analysis of document supply (borrowing) data

Findings from this data analysis led to the Research Library's decision to require electronic submission as a process improvement solution. This has saved staff time in manually transferring data from non-electronic formats into the ILLiad system.

During FY 03, the Library received 7,262 document supply requests, an average of 605 requests per month. Approximately 50 percent of these requests were submitted electronically through ILLiad. Approximately 25 percent, or 1,823 requests, were for biomedical and health-related articles in support of the new NIST research focus area in

Healthcare. One fourth of all of these requests arrived via paper form, e-mail message, or telephone.

During FY 04, 5,957 document supply requests for materials were received, an average of 496 requests per month. Approximately 64 percent of these requests were received electronically through the ILLiad system. About 20 percent, or 1,221 requests, were for biomedical and health-related articles. The remaining 16 percent, or 931 requests, were submitted by paper form, e-mail, telephone, or other means.

In June 2004 the Research Library changed its policy to require electronic submission of all requests to take advantage of ILLiad as a paperless solution, and to streamline the processing, tracking, and handling of requests. In FY 03 approximately half of the requests were submitted through ILLiad electronically. By the end of FY 04, electronic submissions had increased to two thirds. Currently, virtually all requests are received electronically.

Types of materials requested

The data analysis indicates that journal articles account for 86 percent of the requests filled outside of the Research Library in both FY 03 and FY 04. Journal articles also account for 99 percent of the internal document requests in FY 03 and FY 04. Clearly, access to journal literature is critical to the research needs of NIST scientists. It is anticipated that this trend will continue as the quantity of article requests exceeds those for books and other materials each year. It is therefore important that the Research Library continues to provide access to journal titles that meet customer information needs whether from the Research Library's collection or external suppliers.

Costs

Every year the Research Library pays significant item and copyright fees for document supply (borrowed) materials. These costs are not passed on to the customer, resulting in their perception that requests are filled for free. Item fees are paid through OCLC's ILL Fee Management (IFM) Service. Payment of copyright fees, including royalty and related transactional fees, is facilitated through the Copyright Clearance Center (CCC). Table I shows the increases in costs associated with these fees.

The total average cost per item increased approximately 38 percent from FY 03 to FY 04. This is due, in part, to an increase in the royalty fees established by the rights-holders. The average royalty fee rose approximately 37 percent from \$17.74 in FY 03 to \$24.23 in FY 04.

In addition, there was a dramatic increase in the copyright transaction charge. In 2004, the CCC changed its transactional fee structure from \$0.30 per item to \$3 per

Table I Average fees per document supply (borrowed) item, FY 03 and FY 04

Type of charge	FY 03 (\$)	FY 04 (\$)
Item fees	11.87	13.97
Copyright royalty fees	17.74	24.23
Copyright transactional fees	0.30	3.00
Total average cost per item	29.91	41.20

item, an increase of 1,000 percent (Ardito, 2004). It is hoped that the transaction cost will remain stable over the next 3-5 years; however, it is uncertain how the royalty fees may change. Preliminary data for 2005 indicate that the average royalty fee has risen to \$28.76, an increase of 19 percent. As costs continue to rise each year, it will be difficult for the Research Library to continue its current practice of absorbing all expenses. One solution would rely on low or no-cost sources to control costs. Open access journals, electronic document archives, and repositories are also viable replacements for the traditional sources.

Heavy use customers

The analysis uncovered usage inequities among library customer groups. Certain NIST laboratories were identified as heavy users of the document supply services, while others were minimal. In particular, three laboratories, MSEL, CSTL, and PL combined, account for over 75 percent of the items requested in both FY 03 and FY 04. Table II summarizes the requests by these heavy use laboratories.

These data uncovering pockets of heavy users could be used in the future to establish a charge back plan, should the Research Library no longer be able to continue absorbing all of the document supply costs.

Frequently requested journal titles

Requests were analyzed according to journal title in an effort to compile a list of the top ten titles requested in FY 03 and FY 04. Interestingly, only two titles appeared in both lists. For both years, the frequently requested titles were in the biomedical and health-related fields. This is consistent with the NIST strategic research focus areas of Healthcare and Nanotechnology, areas in which the Research Library's collection is weak.

Studies (Murphy and Rupp-Serrano, 1999) have shown that frequently requested journal and book titles are instrumental in assisting with collection development. Annually, the Research Library's Collection Development Team reviews journal titles for renewals, cancellations, and new acquisitions. Some of the electronic journal subscription plans permit drop/add adjustments to the titles each year. Frequently borrowed journal titles are often added at this time. Other factors considered are the journal's impact factor, the number of NIST authors publishing in the journal, and the subscription cost. A cost benefit analysis of the frequently requested titles is considered before electing to subscribe or continue borrowing. For example, 40 articles requested from an \$8,000 journal in 2004, at an average cost of \$41.20 per article, totals \$1,648. At this cost per article and rate of request, it is still more cost effective to continue obtaining the

articles through document supply rather than purchasing a subscription.

Books that are frequently borrowed are also candidates for acquisition; consideration is given as to whether the need is for a one-time special project, or within the subject profile of the NIST collection development, particularly the strategic focus areas. From the data analysis, recommendations are made to purchase books that have proven to reflect the research needs of the staff.

Findings from analysis of internal document request data

Internal document requests are filled for items in the Research Library's collection; fulfillment is primarily in electronic format. As supported by the data, the heavy use customers for this service are the same as for document supply. In 2003, 2,797 internal requests were received; in 2004 the requests dropped to 2,040. The decrease can be attributed to an increase in the number of electronic journal subscriptions that customers can access from their desktops, resulting in fewer requests for items on the shelf. In response to customer preference, as indicated in the previously mentioned customer satisfaction survey (Silcox and Deutsch, 2003), the Research Library has actively increased its electronic resources. For example, in 2004, NIST researchers downloaded 96,694 articles in PDF format from the Research Library's primary electronic journal publishers. Without this access, these articles would have been processed through document supply or as internal requests. Consortium agreements permit "Big Deal" arrangements, expanding access to a broader range of electronic resources that are not subscribed to directly. Electronic journals provide immediate access for customers and improve the speed of the delivery process as there is no Research Library staff intervention in fulfilling the request.

The recent installation of a self-service networked scanner in the public Reading Room of the Research Library permits researchers to scan their own articles and send them electronically to their desktop. The minimal investment expended in acquiring the scanner has more than paid for itself with the positive comments and constant usage. A scanner upgrade is planned for the next fiscal year.

Taking the next steps

Usage analysis of this type raises as many questions as are answered. The Research Library has extracted useful data on its customers, type of materials requested, and subject matter read. As costs escalate, the Research Library strives to continue providing the same level of service and content year after year. These data are valuable in providing the big picture

Table II Document supply (borrowed) requests: heavy use labs, FY 03 and FY 04

Lab	Number of requests	FY 03	Number of requests	FY 04
		Percentage of total requests		Percentage of total requests
MSEL	2,436	34	2,118	36
CSTL	2,392	33	1,855	32
PL	606	8	522	9
Total	5,434	76	4,495	77

about customers and their information needs, and have an immediate impact on collection development and acquisition.

Costs continue to be a major issue in providing access to customers. At present, all document supply expenses are paid by the Research Library regardless of cost. While the number of requests may decline, costs continue to rise in the form of item and copyright fees. On the other hand, customers' expectations are that document supply remains a free service. This perception is supported by a recent landmark study from OCLC (OCLC, 2005): "Information consumers feel that information should be free. Most respondents will not pay for information". Another study (Yang, 2004) found that a free service is very important to customers, in this case for internal requests. Customers do not want to pay for reproduction and electronic delivery of in-house items. After assessing both document supply and internal request data and related costs, the Research Library concluded that it will continue to provide a free service for items held in the collection. In the eventuality that the Research Library's budget can no longer support "free" document supply, the Research Library has the data to introduce a charge back policy.

The Research Library is considering a number of options for covering costs through charge back. These include each laboratory paying for their usage, perhaps at the end of each year or at the time the request is fulfilled; fees could also be incurred for library services according to customer type. The customers in each heavy use laboratory (Table II) consist of NIST staff, guest researchers, and students. The guest researchers make up approximately 22 -30 percent of the "heavy use" population. Yet, they do not contribute to the Research Library's funds through their respective laboratory's overhead support. At this stage, the Research Library is not implementing a charge back program.

There are other options for the Research Library to consider. Customers need to be educated about the costs associated with document supply. It is not free and therefore should be requested judiciously. To raise this awareness, a campaign is under way to raise customer awareness that the Research Library pays for this service for their benefit. Campaign activities include articles in the Research Library's newsletter and announcements on the ILLiad log-on screen, stating that this is not a free service and users should consider each request carefully.

Process improvements also came out as by-products of the data analysis as the Research Library strives to streamline the workflow and reduce processing time. The implementation of federated searching that enables customers to locate articles seamlessly from multiple databases will expedite customer access to needed information. It is anticipated that this will be operational by the fall of 2006. Keeping up to date with ILLiad upgrades will provide improved functionality to processing and workflow as enhancements are introduced. Active participation in the local ILLiad User Groups and continuing education programs, enable the Research Library

staff to take advantage of improvement opportunities as they arise.

Conclusion

It is obvious from the usage data and cost analysis that customer requirements for document supply as well as electronic collection development are closely related. Procurement of one has not proved to offset the costs of the other. In fact, the costs for each continue to rise. Although the demand for document supply and internal requests has slightly declined as new research areas evolve, it is likely that these two functions will continue to be inter-related.

Some other issues that have emerged from this study and require further investigation are:

- the allocation of NIST fiscal resources and the need for an increase in NIST Research Library resources;
- the use of synchronized passwords across many Research Library resource applications; and
- the use of Research Library resources by NIST guest researchers and the costs associated with this use.

The Research Library will continue to monitor customer demands, statistics, and trends to determine future services and improvements.

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